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E04C

(54) Patterned structural cast plates

(57) The invention relates to a method and apparatus for the production of patterned rendered structural features (for example, "crazy-paving") such as may be incorporated on walls, paths, patios and pavements.

The apparatus generally comprises a grid-like former which consists of a series of strips 12, 14, 16, 18, 20 joined together to form an irregularly shaped primary frame and some strips 21, 22, 24, 26, 28 providing branches radiating from the frame so that a great variety of patterns can be produced by a collocation of formers (see Fig. 6).

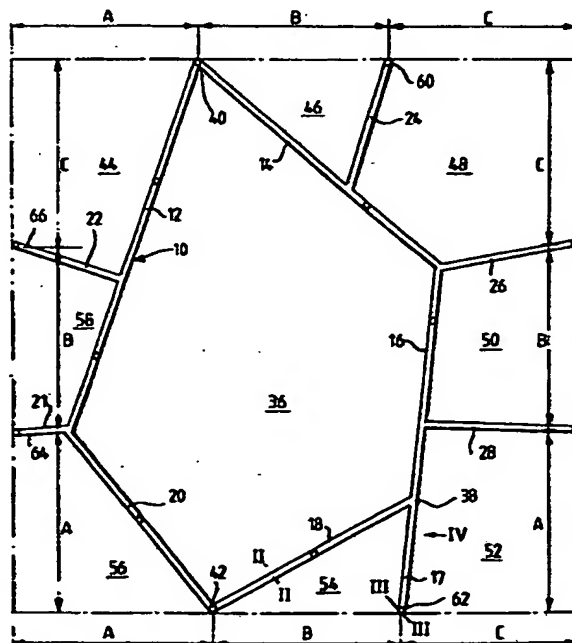
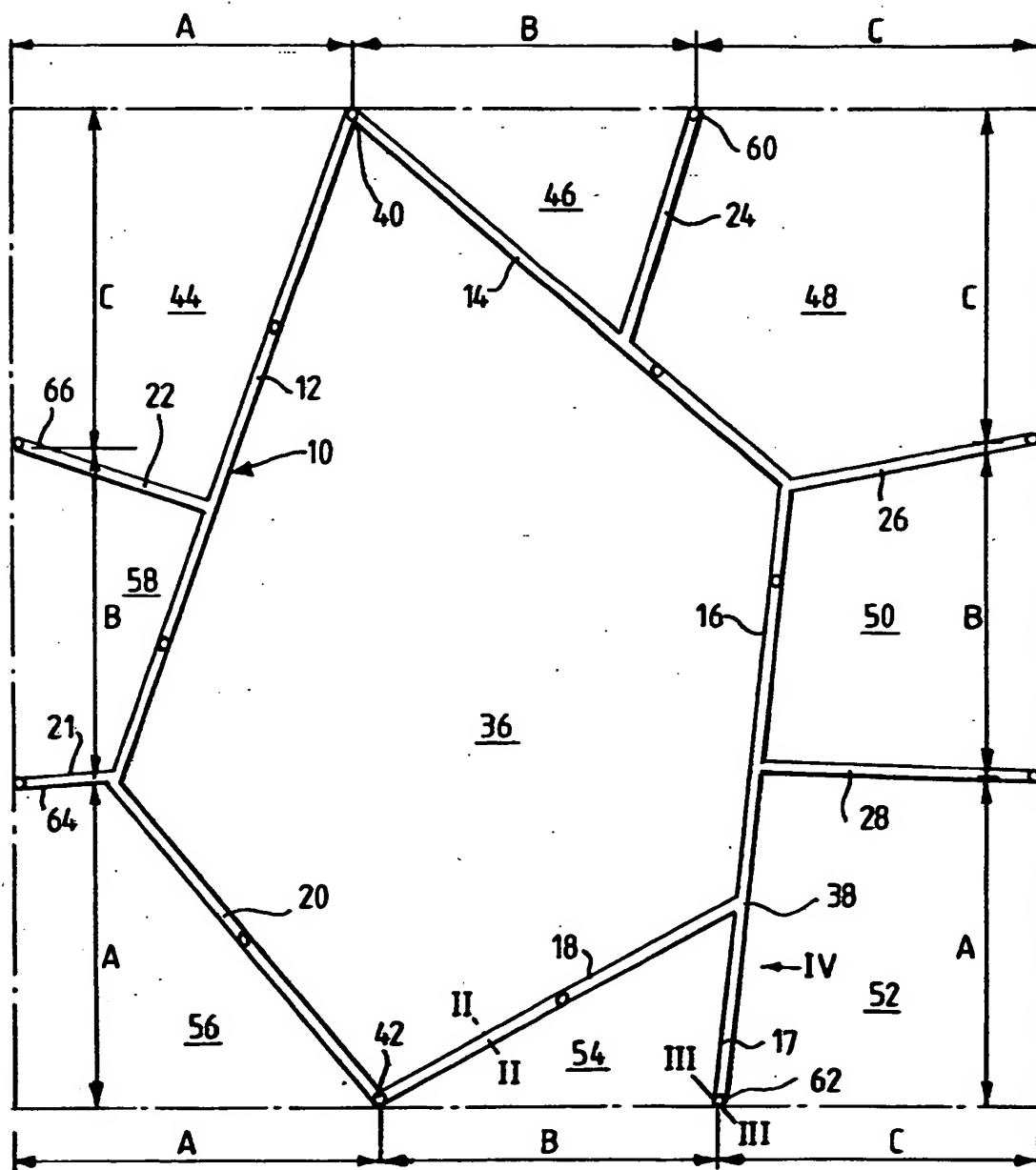


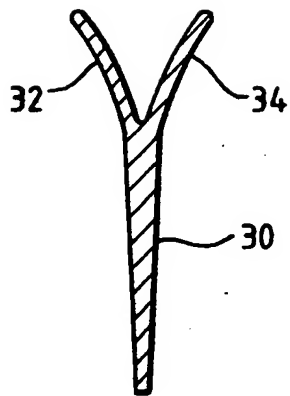
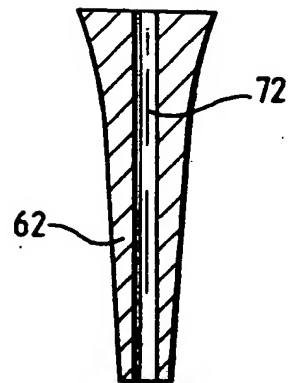
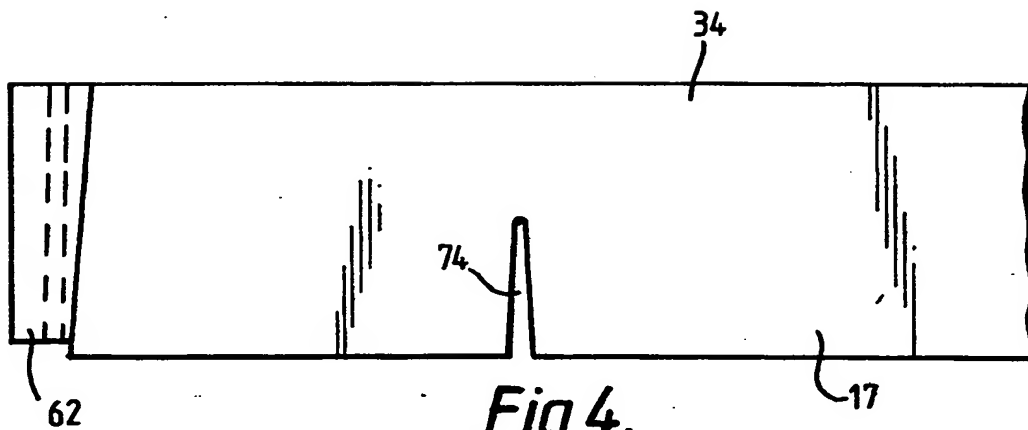
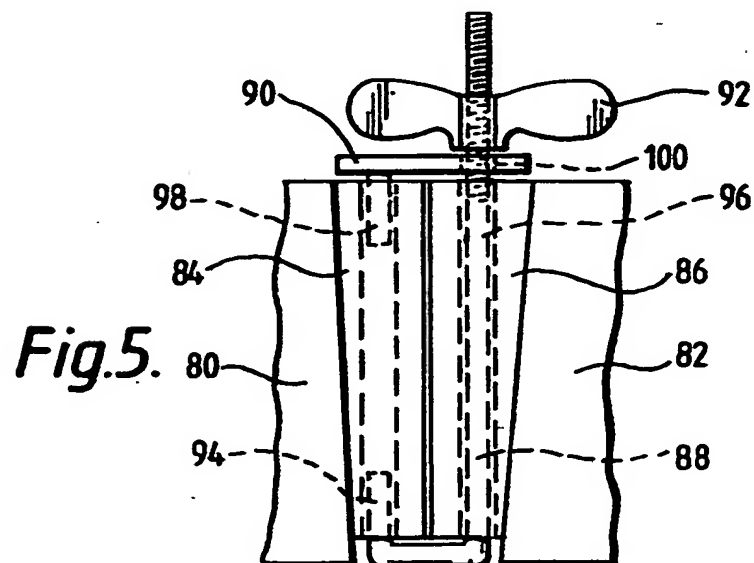
Fig.1.

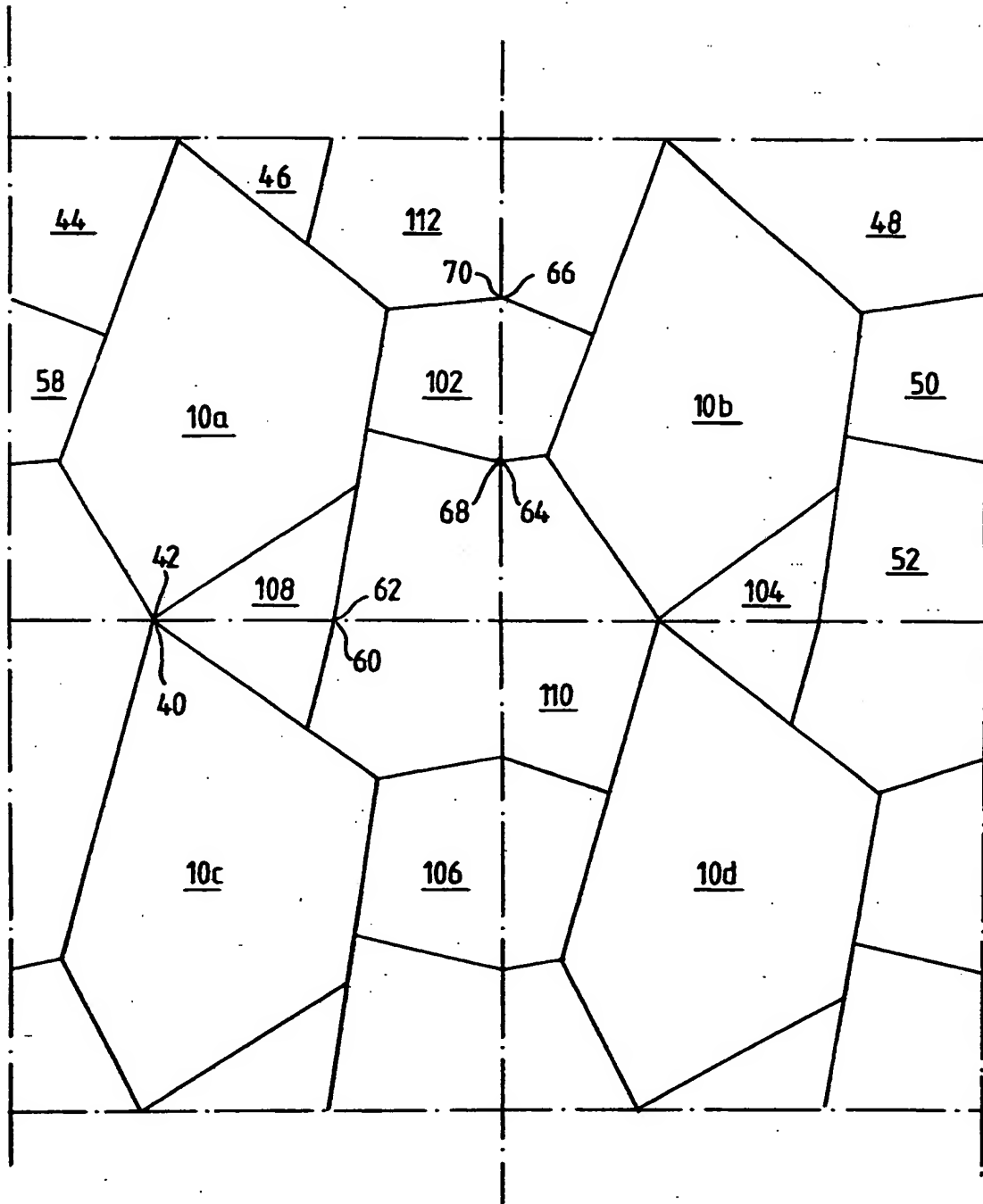
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*Fig. 1.*

*Fig. 2.**Fig. 3.**Fig. 4.**Fig. 5.*

*Fig.6.*

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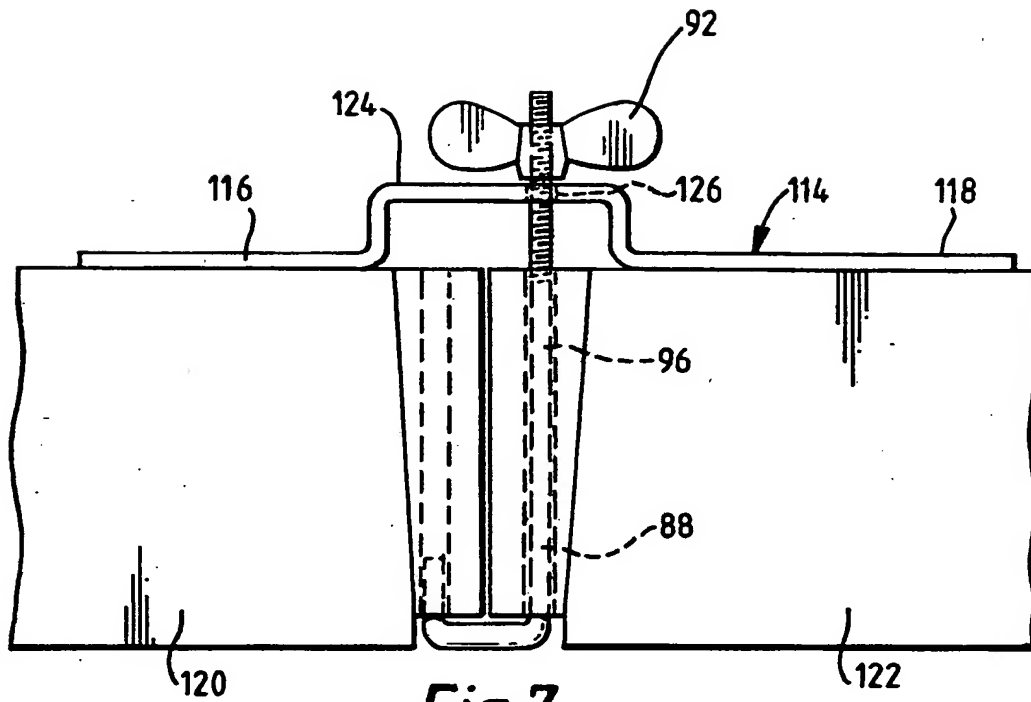


Fig. 7.

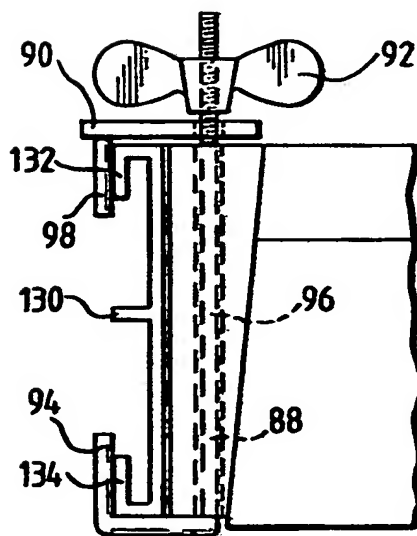


Fig. 8.

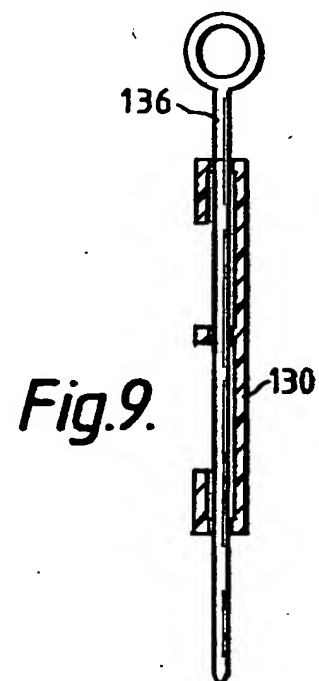


Fig. 9.

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Fig.10.

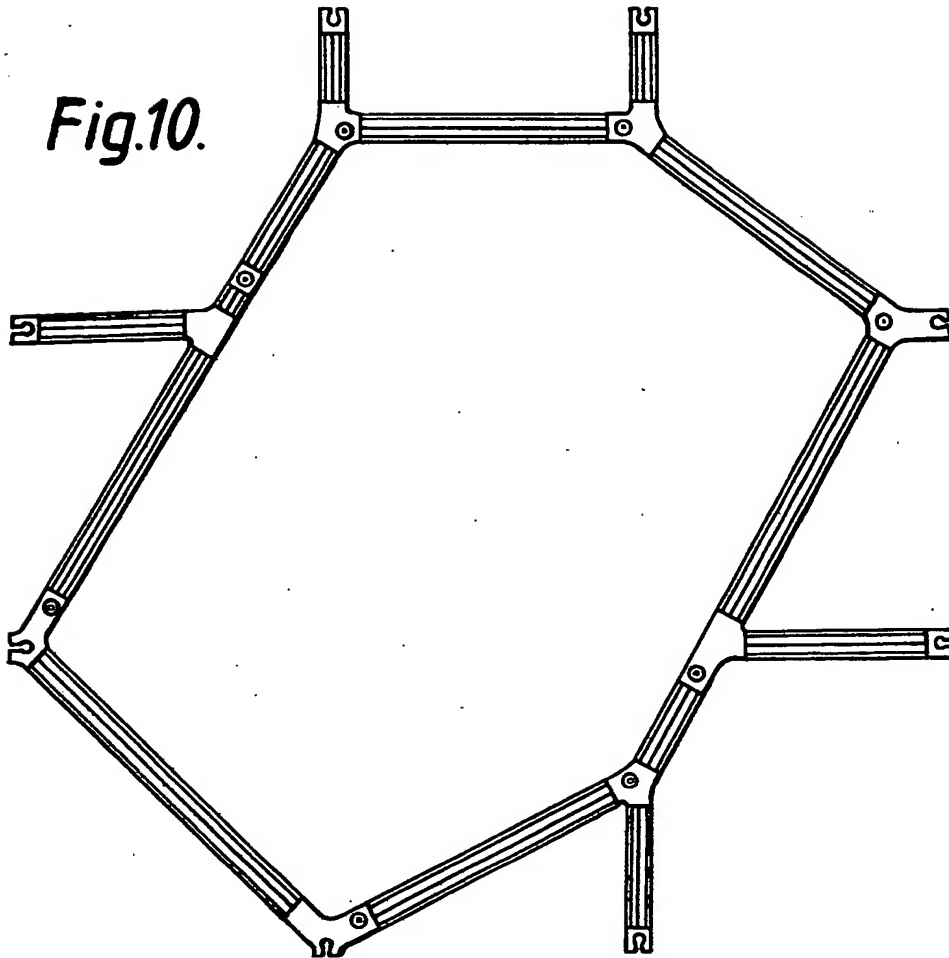
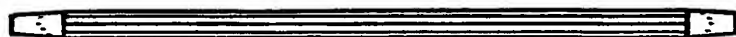
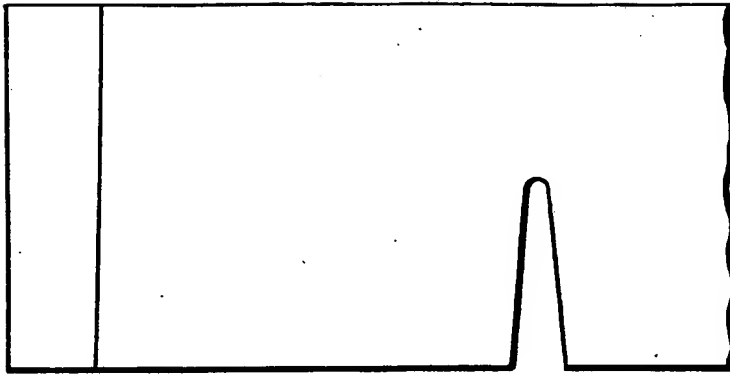
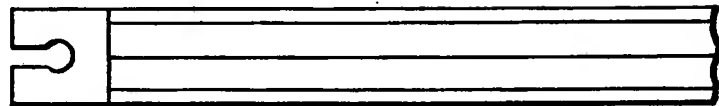


Fig.11.



Fig.12.



*Fig. 13.**Fig. 14.**Fig. 15.**Fig. 16.*

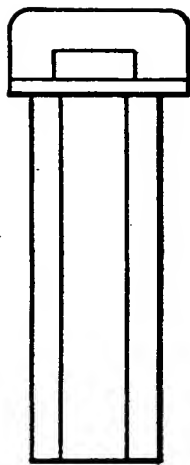


Fig. 17.

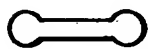


Fig. 18.

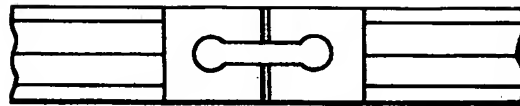


Fig. 19.

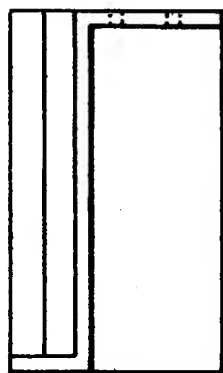


Fig. 20.



Fig. 21.



Fig. 22.

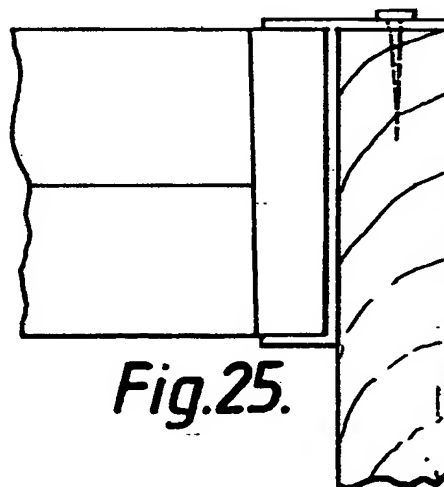


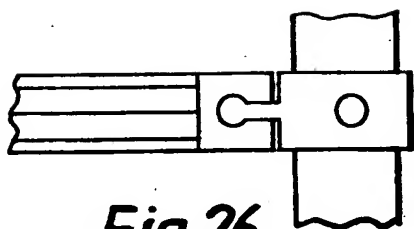
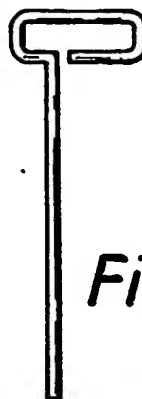
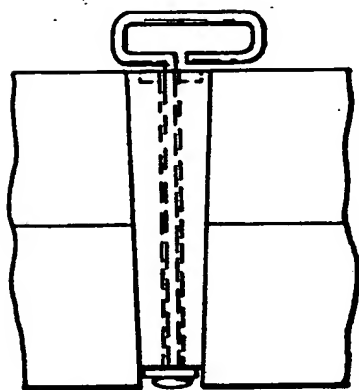
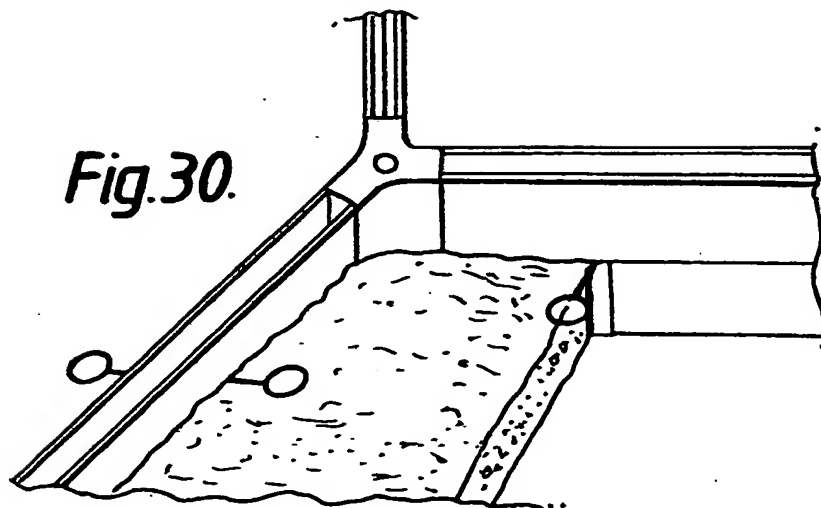
Fig. 25.

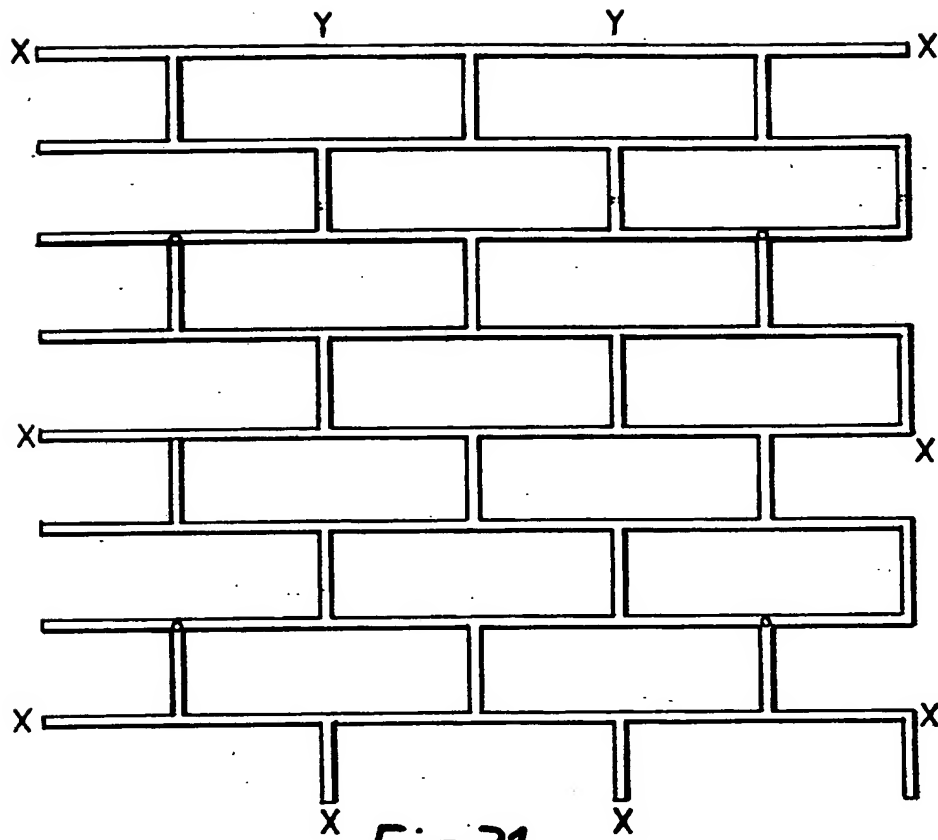
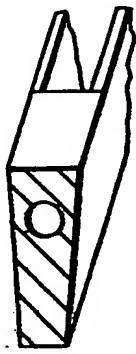
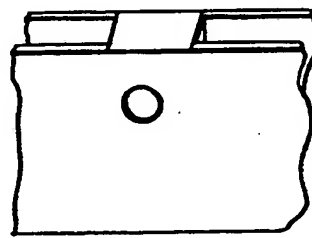


Fig. 24.



Fig. 23.

*Fig. 26.**Fig. 27.**Fig. 28.**Fig. 29.**Fig. 30.*

*Fig. 31.**Fig. 32**Fig. 33.**Fig. 34.*

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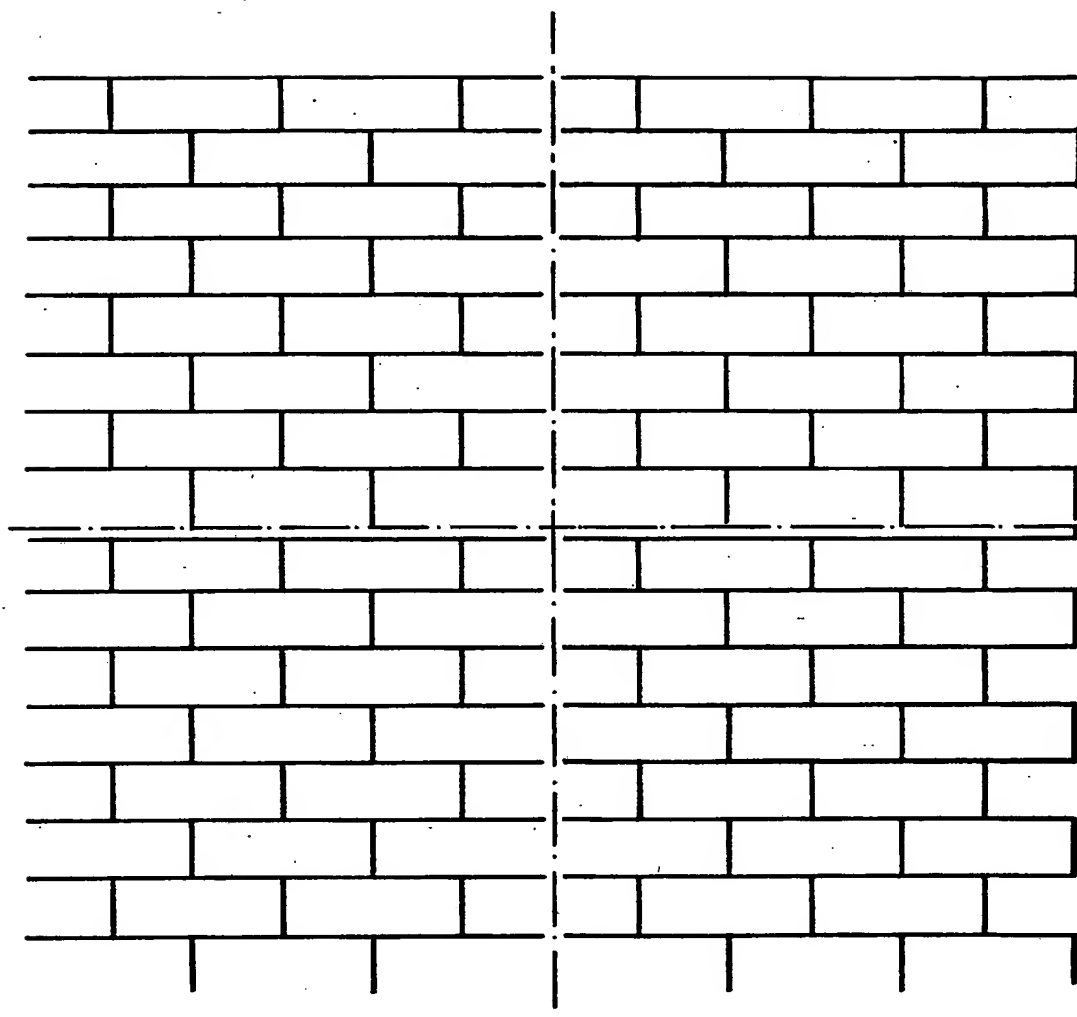


Fig. 35.

"Patterned rendered structural features"

The invention is concerned with a method and apparatus for the production of patterned rendered structural features and patterned structural features produced by the method and/or by the use of the apparatus.

The expression "rendered structural feature" as used herein is intended to include such features as:-

- cement rendered walls, internal or external;
- plastered walls (usually internal);
- poured concrete walls;
- poured cement paths, patios and pavements.

The invention is capable of use with any such rendered structural feature, wherein the rendering is applied or moulded when in a plastic or paste-like state, and becomes hard when set.

It is thought that the present invention will be principally used to produce so-called crazy-paving paths, patios and floors, in which case, the patterned rendered structural feature will generally have a horizontal exposed surface (the patterned surface) and the rendering will take the form of a mortar and aggregate screed. It should be understood however, that the invention can be applied in the production of non-horizontal areas, for example in the rendering of vertical walls.

According to one aspect of this invention a grid-like former for use in the production of a patterned rendered structural feature comprises a series of strips joined together, some of the strips forming a primary frame adapted to circumscribe at least one primary area of the rendered feature, and some of the strips providing branches radiating from the primary frame or frames whereby there are extremities of the former on the branches, so that a plurality of such formers can be assembled with their respective extremities in close

juxtaposition to produce secondary irregularly shaped frames adapted to circumscribe areas of the rendered feature adjacent to the primary area or areas, each secondary frame being comprised of strips of at least two formers.

In one form of the invention the or each primary area is of irregular shape. The primary area(s) and/or the branches may be of non-straight line shape and may be of irregular shape to simulate the edges of broken slabs.

According to a preferred feature of the invention at least one extremity of the former is provided by a junction of two strips forming a primary frame. Hence, a single former may have extremities formed on both branches and the primary frame.

A branch strip may extend from the side of a primary frame, or it may extend from a joint of a primary frame. Such a branch strip may be a continuation of a strip forming a primary frame. In any event, one end of a branch strip will always be attached to a primary frame at some position, and the other end will be unattached, thereby forming one of the extremities of the former. It is further preferred that the branch strip arrangement varies from side-to-side of a primary frame.

According to another preferred feature, the extremities of the former may all lie in the perimeter of an imaginary regular geometrical shape (e.g. a triangle, rectangle, square or hexagon) and they may be so located that they will match up with the extremities on two or more "sides" of a similar former. In the preferred construction the extremities are located in the perimeter of an imaginary square, and occur at the same longitudinal dispositions in each side of the "square" so that any side of one such former will match up to any side of a similar former. Such an arrangement allows of great variety in the patterns which can be produced by a

collocation of formers, particularly if each "side" of the "square" has its own arrangement of branches distinguishing it from all three other "sides".

Preferably a vertical hole (the adjective "vertical" relating to a former lying horizontally, that is with its open sides at the top and bottom) is formed in the former at each extremity, so that two mating extremities of two formers can be joined by a "U" shaped connector one leg of which is fitted into the hole of each mating extremity. There may be a boss or thickened portion of the former around each such hole.

In the preferred construction each strip of the former tapers in cross-section from a wide top edge to a narrow bottom edge. This feature is particularly of use in drawing the former out of a rendered feature after the rendering has set, and it also assists in the manufacture of the former, especially if a moulding technique is used for this purpose. Preferably the strip has a narrow tapering cross-section from the base upwards, but near to its upper edge, it is bifurcated, the "wings" forming the bifurcation spreading from each other at a greater included angle than the angle of taper of the narrow part of the strip.

Transverse slots open at the bottom edge are preferably formed through some or all of the strips making up the former. These slots permit rod-like anchors (e.g. nails) to be laid in the poured material during production of the rendered feature, each such anchor extending through one of the slots, so that it becomes embedded in two discrete areas of the rendered feature. Because the slot is open at the lower end, the former can be lifted off the anchor(s) leaving the latter in situ. Such in situ anchors are of value in preventing relative displacement of one discrete rendered area relatively to adjacent rendered areas, and hence it is possible to produce a rendered area, which is superior in this

respect, to an area by laying preformed slabs.

According to another preferred feature of the invention a kit for use in the production of a patterned rendered structural feature comprises two or more grid-like formers each comprising a series of strips joined together so that at least some of the strips provide radiating branches, whereby there are extremities on the branches so that a plurality of such formers can be assembled with their respective extremities in close juxtaposition to produce frames adapted to circumscribe areas of the rendered feature, at least some of the frames being comprised of strips of at least two formers, and at least one connecting set comprising a "J"-shaped element, the long and short legs of which are adapted to engage respectively from the undersides in the holes formed in two mating extremities of two formers, the long leg then projecting above the formers, and this leg being screw-threaded at its upper end, a clip comprising a plate formed with a hole to receive the upwardly projecting part of the long leg of the J-shaped element, and a downwardly projecting peg adapted to fit into the top end of the hole in which the short leg of the J-shaped element is received, and a nut engageable with the screw-threaded upper portion of the J-shaped element. It will be appreciated, that it is possible to form a joint between two mating extremities of two formers, by passing the long leg of the J-shaped element upwardly through one of the holes, until the short leg of the J-shaped element is also engaged in the other hole, and then threading the clip over the upwardly projecting long leg of the J-shaped element, and engaging the peg in the top end of the other hole, and finally engaging the nut on the screw-threaded portion of the J-shaped element, and tightening it on to the clip, whereby the two extremities of the formers are clamped together between the U-shaped lower end of the J-shaped element, and the U-shaped

formation provided by the clip and the upper portion of the long leg of the J-shaped element. Preferably the nut is a wing nut, or a similar easily manipulable nut.

Preferably the former is constructed in accordance with the first aspect of the invention.

The kit may also include a bridge element having a pair of feet for engagement with the top surface of a rendered feature, after it has set, and an upwardly offset bridge between the feet, wider than two of the strips of the former at a junction formed by mating extremities, there being a clearance hole formed through the bridge to receive the upper portion of the long leg of the J-shaped element. It is possible to remove the clip after the rendering is completed (leaving the top end of the long leg of the J-shaped element projecting above the rendered feature) and then to place the bridge over the joint by threading it on the projecting leg, so that when the nut is fitted on to the projecting leg and tightened down on to the bridge, the parts of the two formers adjacent to the joint are lifted out of the rendered feature. This provides a convenient way of easing the formers out of the rendered feature after the rendering has set, and it will be appreciated, that it is only necessary to use this method to produce the initial disengagement between the tapered strips of the former and the set rendering material, since after this initial disengagement, the former is quite free to be extracted from the rendered feature.

A kit in accordance with the invention may also include a straight edging strip of similar depth to the strips of the grid-like formers, the thickness of the edging strip being such that it can be held clamped against the extremities along one side of the former by J-shaped elements having their long legs fitted into the holes in the extremities, the short legs then engaging with the outside face of the edging strip. However, it

is also envisaged that edging strip may be provided, which is formed with holes similar to those at the extremities of the former, whereby the edging strip can be secured to the former, in similar fashion to the securing of two formers together.

The kit may further include a skewer for securing the former and/or an edging strip to a substrate during production of the rendered feature.

According to another aspect of the invention a method of producing a patterned rendered structural feature comprises the steps of: providing a former which comprises a grid-like structure made up of strips joined together so that the former has radiating branches; laying this former on a substrate; pouring mortar into at least some of the spaces in the grid-like structure of the former and allowing the mortar to set, where a rendered feature is provided on the substrate divided into discrete areas by the strips of the former. Preferably the former is removed after the mortar has set.

In one method of carrying out this aspect of the invention, where the rendered feature is longer than the former, after the former is removed from the set mortar, it is re-laid in a fresh position on the substrate adjoining the set mortar, and the process repeated to provide an extension of the rendered feature. Preferably, at the first position, mortar is placed along at least one side of each branches of the former which projects towards the second position, so that a mortar location strip or strips of mortar is or are formed whereby the former can be brought into abutment with such location strip or strips at the second position.

According to yet another aspect of the invention a method of producing a patterned rendered structural feature comprises the steps of: assembling two or more grid-like formers edge-to-edge on a substrate, each of

which formers comprises a series of strips joined together, so that at least some of the strips radiate from a central feature of the frame, and assembly being such that extremities on the or each abutting pair of assembled frames are in such close juxtaposition that secondary frames are formed, each circumscribed by branch strips on at least two of the assembled formers; pouring mortar into some or all of the secondary frames and allowing the mortar to set, whereby a complete rendered feature is provided on the substrate divided into discrete areas by the strips of the formers. Preferably the formers are secured together before the mortar is poured.

In any of the methods of producing a patterned rendered structural feature the former may be constructed in accordance with the first aspect of the invention, so that it has a primary frame from which branches radiate.

It is a preferred feature of the method aspects of the invention, that the formers are withdrawn from the rendered feature after the mortar has set, leaving dividing grooves between the discrete areas of the feature. These grooves may be filled or partially filled with cement, mastic, plastics or other pointing material to form outlines in the patterned area. If the strips of the formers are of tapering cross-section, then the grooves left in the rendered feature will also have a tapering cross-section, and this is of advantage in securing the pointing in the grooves.

Preferably the discrete areas formed within the frames, are made of differently coloured materials, so that an overall coloured patterned effect is obtained. It is also preferred, that the pointing material is of different colour to at least some of the rendering material, whereby distinctively coloured outlines are visible in the finished rendered structural feature.

The invention also includes patterned rendered

structural features when made by the method of the second aspect of the invention, or made by a method which involves use of grid-like formers in accordance with the first aspect of the invention.

The invention will be better understood, from the following description of certain exemplary forms of the apparatus, and its method of use. In the accompanying drawings:-

Figure 1 is a plan view of a single former made in accordance with the first aspect of the invention,

Figure 2 is a typical section through a part of the former taken on the line II-II in Figure 1,

Figure 3 is a section through a typical extremity of the former, taken on the line III-III in Figure 1,

Figure 4 is an elevation looking in the direction of the arrow IV in Figure 1,

Figure 5 is a diagrammatic representation of a joint between two extremities on abutting formers,

Figure 6 is a diagram illustrating how four formers in accordance with Figure 1 could be used to provide a patterned area,

Figure 7 is a diagrammatic elevation illustrating a method of erasing a former out of a rendered area,

Figure 8 is a diagram showing a method of securing an edging strip to a former,

Figure 9 is a section through an edging strip showing a method of securing it to a substrate.

Figure 10 is a plan view of a single former of modified construction,

Figure 11 is a side view of the former illustrated in Figure 10,

Figure 12 is a plan view of a separate connector strip or loose leg,

Figure 13 is a detailed side view of one end of a branch of the former illustrated in Figures 10 and 11,

Figure 14 is a plan view of the end of the branch

illustrated in Figure 13, showing a half female dumb-bell connection at the end,

Figure 15 is an end view of the branch illustrated in Figure 13,

Figure 16 is a cross-section through the main portion of the branch shown in Figure 13,

Figure 17 is a side elevation of a dumb-bell connector used for joining two branches together,

Figure 18 is a cross section through the operative portion of the dumb-bell connector illustrated in Figure 17,

Figure 19 is an underneath plan view of the ends of two branches on two separate formers, shown connected together by a dumb-bell connector of the type illustrated in Figures 17 and 18,

Figure 20 is a side elevation of a half dumb-bell connector used for attaching the end of a branch to a timber framework.

Figure 21 is a plan view of the half dumb-bell connector illustrated in Figure 20,

Figure 22 is an end view of the half dumb-bell connector illustrated in Figure 20 looking on the lefthand end,

Figure 23 is an underneath plan view of the connector shown in Figure 20,

Figure 24 is an end view of the half dumb-bell connector shown in Figure 20 looking on the righthand side,

Figure 25 is an elevation showing the use of the half dumb-bell connector illustrated in Figures 20 to 24 for connecting a branch to a timber frame,

Figure 26 is a plan view of the connection illustrated in Figure 25,

Figure 27 is a side view of a stainless steel wire hook used for providing a means of withdrawing the former from the finished rendered structural feature, and

for the attachment of the loose leg,

Figure 28 is a detailed view of part of a former shown in Figure 10, with a wire hook as illustrated in Figure 27 attached thereto,

Figure 29 is a detailed plan view of a stainless steel wire tie,

Figure 30 is a perspective view illustrating the use of the tie shown in Figure 29,

Figure 31 is a side view of an alternative construction of former, used for the rendering of a wall to give a brick built appearance,

Figure 32 is a cross-section through one of the limbs of the former illustrated in Figure 31,

Figure 33 is a section through the former illustrated in Figure 31 at the points marked "X" in Figure 31,

Figure 34 is a section of the former illustrated in Figure 31 at the points marked "Y", and

Figure 35 is a view illustrating the assembly of four formers as shown in Figure 1 in order to create a pattern which simulates a brick bond on a wall.

Referring to Figures 1 to 4, there is shown a former 10 which is made up of a series of strips, 12, 14, 16, 18, 20, 22, 24, 26 and 28 which are joined together to form a grid-like structure. All the strips are made in plastics material, and relatively inexpensive material can be used, because as will hereinafter appear, the former only has a temporal use during the construction of a paved area, and it is not required to withstand any substantial loads or wearing forces. In practice, the former 10 will probably be made as an injection moulding, in which case all the strips will be integral with each other, although it is to be understood, that the former could be produced by welding together a series of individually formed strips.

As is shown in Figure 2, each strip has a lower

portion 30, which tapers slightly from top to bottom, and a pair of "wings" 32 and 34 along its upper edge, the wings 32 and 34 forming a bifurcated upper portion of the strip. The depth of the strip governs the thickness of the rendered or paved area which is to be produced by use of the former, and for a wide variety of purposes, a depth of 40 millimetres is to be recommended.

It will be observed from Figure 1, that five of the strips, namely the strips 12, 14, 16, 18 and 20 are joined together to form a complete framework circumscribing a primary space 36. The strips 12, 14, 18 and 20 are joined together end-to-end, but the joint 38 between the strip 16 and the strip 18 is part way along the length of the strip 16. The strips forming the primary frame are of unequal length, and the angular arrangement of these strips produces a five-sided figure, which is of generally irregular shape.

The strips 21, 22, 24, 26 and 28 extend radially from the primary frame, and form branches on the frame. In addition, the portion 17 of the strip 16 which extends outside the primary frame forms an additional branch, which is a straight continuation of the side 16 of the primary frame.

An important feature of the arrangement, is that the entire frame 10, can be considered as occupying square space bounded by imaginary lines, which have been shown as chain-dotted lines in Figure 1. It will be appreciated, that in practice, there are no boundary walls to the frame corresponding to these chain-dotted lines, but they are useful in explaining the shape and construction of the former. One of the features of the former, is that each outer extremity of the branches formed by the strips 21, 22, 24, 26, 28 and 17, lies on an edge of the square frame, and in addition, the joints 40 (formed between the strips 12 and 14) and 42 (formed between the strips 18 and 20) also lie along edges of the

imaginary square. Thus, extremities of the former can be provided either by the unattached ends of the branches which radiate from the primary frame, or by joints in the primary frame itself. It will also be observed, that the branch strips 21 and 26 extend from joints of the primary frame, whereas the branches 22, 24 and 28 extend from positions part way along the lengths of their respective primary frame members 12, 14 and 16.

Because of the somewhat irregular arrangement of the branch strips, a series of part spaces 44, 46, 48, 50, 52, 54, 56 and 58 is formed around the primary space 36, each of these part spaces being defined by strips of the former, and by the imaginary square edge to the former. For example, the primary space 44 is bounded on two sides by the primary strip 12 and the branch strip 22, whereas the part space 48 is bounded on three sides by the branch strip 24, part of the primary strip 14 and the branch strip 26. Of course, since there is no edging strip around the imaginary square, these spaces 44 to 58 are all open on the outsides of the former.

Another significant feature of the arrangement, is the location of the extremities along each side of the former. Thus, the extremity formed by the joint 40 is shown located a distance A from the lefthand side of the imaginary square, and the extremity 60 on the branch strip 24 is shown located a distance B from the extremity 40, and a distance C from the righthand edge of the imaginary square. Now it will be seen, that the extremities 42 formed by a junction of the primary frame, and 62 formed on the branch strip 17 are located in similarly displaced positions relatively to the imaginary lower edge of the square, and likewise the extremities 64 and 66 formed respectively on the branch strips 21 and 22 are displaced by the same distances A and C from the bottom and top edges of the imaginary square, and similarly the extremities 68 and 70 formed

respectively on the branch strips 28 and 26 are displaced by the same distances A and C from the bottom and top edges of the imaginary square. This location of the extremities of the former is significant, because it assists in the production of overall patterned areas, as will appear hereinafter.

Turning now to Figure 3, it will be seen, that at each extremity, the bifurcated upper portion of the strip is filled in, to produce a boss on the former, and there is a vertical bore 72 formed through the boss from top to bottom thereof. In practice, as illustrated in Figure 4, the boss formed at the extremity may be flush with the top edge of the strip, but terminated slightly above the bottom edge of the strip. At a series of longitudinally spaced apart positions along the length of each strip, a notch 74 is formed in the strip, this notch being open at the bottom end, having tapering sides, and having its top end slightly above mid height of the strip.

A kit for the production of patterned areas, will generally comprise a series of formers such as that illustrated in Figure 1. In fact, in a simplified form of the invention, four such formers will be supplied, and they may all be of the same pattern. It is to be understood, however, that the precise shape of the former can be varied, and a kit may therefore comprise a series of formers, of different shapes. In the following description, the simple case in which there are four formers each of the same shape is described.

It is possible to connect the formers, by bringing extremities one on each of two formers into close juxtaposition with each other, as illustrated in Figure 5. In that figure, 80 represents a branch strip having an extremity 84 and 82 represents the junction of two strips of a primary frame, having an extremity 86 formed thereon. For the purpose of connecting the two frames, the two extremities 84 and 86 are brought into

abutting relationship.

The kit includes a number of connecting devices, each of which comprises a J-shaped element 88, a clip 90, and a wing nut 92. The J-shaped element 88 is so constructed, that when the extremities 84 and 86 are brought into abutting relationship, it is possible to insert the short leg 94 into the bottom end of the bore formed in the extremity 84, and to thread the long leg 96 up through the bore of the extremity 86. This of course has the effect of holding the two extremities together and as illustrated in Figure 5, the upper portion of the leg 96, which is screw-threaded projects above the top of the formers which are being joined together.

The clip 90 generally comprises a plate-like element, with a spigot peg 98 depending therefrom, and a hole 100 formed through the plate. The arrangement of the clip 90, is such that the spigot peg 98 can be pressed into the top end of the bore in the extremity 84, and at the same time, the projecting top end of the long leg 96 threaded through the hole 100. When the clip 90 is pressed into the position illustrated in Figure 5, the two abutting extremities are held firmly together, and the joint can be completed by threading the wing nut 92 on to the projecting upper end of the long leg 96, and tightening the wing nut to press the plate of the clip 90 on to the tops of the extremities 84 and 86. It will be appreciated, that it is necessary to form a number of these joints such as that illustrated in Figure 5, in order to secure the series of formers 10 together, although it may not be necessary to form such a joint at every position at which the extremities of the formers abut each other.

Figure 6 illustrates a very simple patterned effect, which is obtained by placing in abutting relationship four formers 10a, 10b, 10c and 10d. In this arrangement, each of the formers is laid in the same

orientation as the others, so that all four primary spaces 36 have the same orientation relatively to the edges of the imaginary squares, which again are shown in chain-dotted lines, in this case in abutting relationship. Now because of the spacing of the extremities, it will be observed, that the extremities on two sides of each former match up with extremities on the sides of two adjacent formers. Thus for example, the extremities 70 and 68 on the former 10a match respectively with the extremities 66 and 64 on the former 10b whilst the extremities 42 and 62 match up respectively with the extremities 40 and 60 on the former 10c. Again, it is to be noted, that the matching pairs of extremities may be formed on branch strips, or on strips of the primary frame, or one on a joint of the primary frame and the other on a branch strip.

When the four formers are brought together and joints formed between abutting extremities, in the manner illustrated in Figure 6, in addition to the four primary areas 36, a series of secondary totally circumscribed areas 102, 104, 106 and 108 is produced, each of which comprises frame elements formed by two of the formers, and in addition there is a tertiary totally circumscribed space 110 the edges of which are formed by strips in all four formers. Each of these spaces is of irregular shape, determined by the strips or part strips by which it is bounded. Furthermore, there remains around the edges of the composite grid produced by the four formers, a series of part spaces similar to those around a single former. In the case of the former 10a for example, part spaces 44, 46 and 58 remain, identical with the spaces of those numbers around the former itself. In the case of the former 10b however, the part spaces 48, 50 and 52 remain. Furthermore, a new part space 112 is formed by the confluence of the part spaces 48 of the former 10a and 44 of the former 10b. Thus, by the putting together of a

series of four formers. as illustrated in Figure 6, an interesting pattern is produced, comprising a series of irregular shapes, and this is desirable in the production of so-called crazy-paving.

However, it is possible to turn each of the formers 10a, 10b, 10c and 10d into any one of four orientations, and hence, a large variety of patterned effects can be produced, even with only four formers, all of which are identical in shape. It will be appreciated, that if a larger number of formers is secured together edge-to-edge, a greater variety of patterns can be produced, and this is multiplied again, if some of the formers are of different basic shapes.

Supposing that it is proposed to lay a crazy-paving path of a width equal to two of the formers, then the four formers 10a, 10b, 10c and 10d are first joined together to form a composite grid-like frame typified by that shown in Figure 6, though the precise pattern will depend upon the orientation of the formers with respect to each other. The substrate under the path is first prepared, and roughly levelled, and then the composite grid-like frame is laid on this substrate. Edging strips (not shown) which may simply take the form of flat pieces of timber, are laid along the longitudinal sides of the composite frame, so that some of the part spaces along the longitudinal edges become totally circumscribed owing to the additional edge provided by the path edge shuttering.

A cement and sand mixture is then poured into each of the spaces formed in the grid-like frame, and this mortar is levelled with the top surface of the frame. It will be appreciated, that levelling is a simple matter, because of the presence of these top edges of the various strips. Further, it is possible to produce only a small quantity of mortar at a time, because this can be poured into all the totally circumscribed spaces, and

allowed to set. Subsequently, the composite frame can be removed from this mortar, and placed in a fresh position along the length of the path which is being formed, allowing a further short section of the path to be poured and levelled. This is of particular importance to the amateur path layer, who may not have the equipment necessary to laying a complete path at a single operation.

Furthermore, it will be appreciated, that different colours of mortar mix can be prepared, and poured into separate spaces within the composite framework, so that a multi-coloured path is produced.

If the path is 40 millimetres thick, then it may be desirable to lay it in two 20 millimetre layers, and if the second layer is laid within 3 hours of the first layer, this is regarded by building regulations as being a monolithic structure. At the state where the first 20 millimetre layer of mortar has been laid in the composite framework, nails are inserted through the upper end of the notches 74 (or some of them) so that each nail lies partly on each side of the strip through which it is passed. When the second layer of mortar is laid, these nails become embedded in the monolithic mortar, and have the effect of tying the discrete paved areas produced by the inserted framework to each other, thus forming a more rigid overall structure. In fact, this facility for tying together the discrete paved areas forms a significant feature of the method.

It will be appreciated, that when the mortar sets, it is necessary to remove the composite framework from the paved area, so that it can be transferred to a new position. This may not be easy, because the framework will to some extent be held in position by the mortar. For the purpose of easing out the framework, a series of extraction elements 114 is provided (see Figure 7). Each of these extraction elements comprises a strip of

plastics material, having long feet 116 and 118 which are adapted to rest on mortar slabs 120 and 122 after the mortar has set, the two feet being joined by a bridge section 124. The bridge section is wide enough to extend across and clear a joint between two extremities, and in addition is formed with a hole 126 to thread over the upwardly projecting top end of the long leg 96 of the element 88. Before the extraction member 114 is employed, the wing nut 92 is removed from the joint, and if desired, the clip 90 can also be removed, though this is not essential. The extraction member is then threaded over the long leg 96, and the wing nut 92 re-threaded on to that leg. When the wing nut 92 is tightened, the J-shaped element 88 is drawn upwardly, and this has the effect of easing the strips at their joined extremities, out of the mortar slabs 120 and 122. Because the strips are of tapering cross-section, it is only necessary to employ the extraction member 114 to produce the initial easing of the strips from the mortar, subsequent removal being unhindered. Hence, it will be seen that the J-shaped element 88 is employed for a dual purpose, partly to form the joints between formers, and partly as a means of extracting the composite frame from the mortar slabs after they have set.

Figure 8 illustrates a preformed edging strip 130 which can be employed and supplied as part of the kit. This edging strip may be made as a plastics extrusion, and as illustrated, is generally E-shaped in cross-section, with inturned lips 132 and 134 on the upper and lower arms of the E. The edging strip may be made in comparatively long lengths, although it will probably suffice to make it equal in length to two of the formers 10, so that it could be employed for example, along the edges of the arrangement illustrated in Figure 6. The thickness of the edging strip is such, that it can easily be secured to extremities of the formers 10, by the J-

shaped element 88 as illustrated in Figure 8. Again, the long leg 96 of the element 88 is threaded through the bore of one of the extremities, but in this instance, the short leg 94 presses against the lip 134 of the edging strip, so that the latter is pressed against the extremities on the former, and similarly the spigot peg 98 of the clip 90 presses against the outside of the lip 132 at the top edge of the edging strip 130. The wing nut 92 is again employed to lock the securing device together.

As illustrated in Figure 9, vertical holes may be formed through the edging strip 130 at longitudinally spaced apart positions, and the kit may include a series of metal skewers 136 which can be threaded through the holes in the edging strip, and engaged in the substrate beneath the paved area. With this arrangement, providing the edging strip is flexible, it is possible to produce curved edges on the path, because the skewers 136 can be used to sustain a selected curved formation of the edging strip.

In the foregoing specified example, it has been assumed that a path is being laid. It will be appreciated however, that the invention can be employed to produce relatively large paved areas, such as patios, and indeed the invention could also be employed to produce patterned effects on plastered surfaces of vertical walls. Moreover, it is not necessary to pour mortar into all the spaces of the composite framework. Instead, some of the spaces may be filled with top soil, so that it is possible to grow plants and/or grass in these top soil filled areas.

A separate strip or strips may be provided, which can be placed across the primary space of any of the formers to divide that space into two or more smaller primary spaces. This assists in creating varied patterns.

The earlier part of this specification comprises pages 1 to 22 of the description of U.K. Patent Application No. 8623998 which are hereby incorporated into the present description specification.

In an alternative embodiment at least a substantial part of each former is formed as an integral plastics moulding i.e. so that the primary frame and the branches are formed as a single piece. In such a case a loose leg or branch may be formed integrally with the former so that the branch is connected to the former at each end by a single plastics wafer which allows the loose arm to be removed readily from the former.

In the case where the legs or branches of the former include a bifurcation, the divergent bifurcations can be strengthened by means of a series of transverse stiffening ribs. Alternatively, the top of each branch may be closed (i.e. a solid rod) or open only to the extent that concrete, plaster, etc. cannot enter the bifurcation and, in time, cause blockages or clogging.

At least some of the legs or branches can be formed with an integral lifting handle, the design of the upper portion of which is similar to the design shown in Figures 18 and 19, so that a separate former-lifting handle may be attached to each branch-lifting handle by means of a resilient wire or strap. The former lifting handle may comprise a plastics D-shaped ring having an upper handgrip portion and a lower wire or strap receiving portion.

The drawings of this application comprise sheets 1 to 9 of the drawings of U.K. Patent Application No. 8623998 which are hereby incorporated into the present specification.

CLAIMS

1. A grid-like former for use in the production of a patterned rendered structural feature comprises a series of strips joined together. some of the strips forming a primary frame adapted to circumscribe at least one primary area of the rendered feature, and some of the strips providing branches radiating from the primary frame or frames whereby there are extremities of the former on the branches, so that a plurality of such formers can be assembled with their respective extremities in close juxtaposition to produce secondary irregularly shaped frames adapted to circumscribe areas of the rendered feature adjacent to the primary area or areas, each secondary frame being comprised of strips of at least two formers.

Additional claims 2 to 45 have been filed as follows:-

2. A grid-like former according to Claim 1 wherein the or each primary area is of irregular shape.
3. A grid-like former according to Claims 1 or 2 wherein the primary area and/or the branches are on non-straight line shape and are of irregular shape to simulate the edges of broken slabs.
4. A grid-like former according to any preceding claim or claims wherein at least one extremity of the former is provided by a junction of two strips forming a primary frame.
5. A grid-like former according to any preceding claim or claims wherein a branch strip extends from the side of a primary frame or from a joint of a primary frame.
6. A grid-like former according to Claim 5 wherein the branch strip is a continuation of a strip forming a primary frame.
7. A grid-like former according to Claims 5 or 6 wherein one end of a branch strip is always attached to a primary frame at some position and the other end is

unattached.

8. A grid-like former according to Claim 7 wherein the branch strip arrangement varies from side-to-side of a primary frame.

9. A grid-like former according to any preceding claim or claims wherein the extremities of the former all lie in the perimeter of an imaginary geometrical shape so that they can be so located that they will match up with the extremities of two or more "sides" of a similar former.

10. A grid-like former according to Claim 9 wherein the extremities are located in the perimeter of an imaginary square, and occur at the same longitudinal dispositions in each side of the "square" so that any side of one such former will match up to any side of a similar former.

11. A grid-like former according to Claim 10 wherein each "side" of the "square" has its own arrangement of branches distinguishing it from all three other "sides" so that a great variety of patterns can be produced by a collocation of formers.

12. A grid-like former according to any preceding claim or claims wherein a vertical hole is formed in the former at each extremity, so that two mating extremities of two formers can be joined by a "U"- shaped connector one leg of which is fitted into the hole of each mating extremity.

13. a grid-like former according to any preceding claim or claims wherein a vertical groove is formed in the former at each extremity, so that two mating extremities of two formers can be joined by a co-operating "dumb-bell" cross-section connector one "bell" of which is fitted into the groove of each mating extremity.

14. A grid-like former according to Claims 12 or 13 wherein there is a boss or thickened portion of the

former around each such hole or groove.

15. A grid-like former according to any preceding claim or claims wherein each strip of the former tapers in cross-section from a wide top edge to a narrow bottom edge.

16. A grid-like former according to Claim 15 wherein the strip has a narrow tapering cross-section from the base upwards, but near to its upper edge, it is bifurcated, the "wings" forming the bifurcation spreading from each other at a greater inclined angle than the angle of taper of the narrow part of the strip.

17. A grid-like former according to Claim 16 wherein the "wings" forming the bifurcation are reinforced by transverse strengthening ribs at periodic locations.

18. A grid-like former according to Claim 15 wherein any holes or grooves formed through or in the upper surface of each strip are of a size or shape so that any tendency of plaster, cement or concrete to enter and clog such holes or grooves is reduced.

19. A grid-like former according to any preceding claim or claims wherein transverse slots open at the bottom edge are formed through some or all of the strips making up the former.

20. A grid-like former according to Claim 19 wherein the transverse slots permit rod-like anchors (e.g. nails) to be laid in the poured material during production of the rendered feature, each such anchor extending through one of the slots, so that it becomes embedded in two discrete areas of the rendered feature.

21. A kit for use in the production of a patterned rendered structural feature comprising two or more grid-like formers each comprising a series of strips joined together so that at least some of the strips provide radiating branches, whereby there are extremities on the branches so that a plurality of such formers can be assembled with their respective extremities in close

juxtaposition to produce frames adapted to circumscribe areas of the rendered feature, at least some of the frames being comprised of strips of at least two formers, and at least one connecting set comprising a "J"-shaped element, the long and short legs of which are adapted to engage respectively from the undersides in the holes formed in two mating extremities of two formers, the long leg then above the formers, and this leg being screw-threaded at its upper end, a clip comprising a plate formed with a hole to receive the upwardly projecting part of the long leg of the J-shaped element, and a downwardly projecting peg adapted to fit into the top end of the hole in which the short leg of the J-shaped element is received, and a nut engageable with the screw-threaded upper portion of the J-shaped element.

22. A kit for use in the production of a patterned rendered structural feature according to Claim 21 wherein it is possible to form a joint between two mating extremities of two formers, by passing the long leg of the J-shaped element upwardly through one of the holes, until the short leg of the J-shaped element is also engaged in the other hole, and then threading the clip over the upwardly projecting long leg of the J-shaped element, and engaging the peg in the top end of the other hole, and finally engaging the nut on the screw-threaded portion of the J-shaped element, and tightening it on to the clip, whereby the two extremities of the formers are clamped together between the U-shaped lower end of the J-shaped element, and the U-shaped formation provided by the clip and the upper portion of the long leg of the J-shaped element.

23. A kit for use in the production of a patterned rendered structural feature according to Claim 22 wherein the nut is a wing nut, or a similar easily manipulable wing nut.

24. A kit for use in the production of a patterned

rendered structural feature in accordance with one or more of Claims 21 to 23 wherein the former is constructed according to any one or more of Claims 1 to 20.

25. A kit for use in the production of a patterned rendered structural feature according to any one or more of Claims 21 to 24 wherein the kit includes a bridge element having a pair of feet for engagement with the top surface of a rendered feature, after it has set, and an upwardly offset bridge between the feet, wider than two of the strips of the former at a junction formed by mating extremities, there being a clearance hole formed through the bridge to receive the upper portion of the long leg of the J-shaped element.

26. A kit for use in the production of a patterned rendered structural feature according to Claim 25 wherein it is possible to remove the clip after the rendering is completed (leaving the top end of the long leg of the J-shaped element projecting above the rendered feature) and then to place the bridge over the joint by threading it on the projecting leg, so that when the nut is fitted on to the projecting leg and tightened down on to the bridge, the parts of the two formers adjacent to the joint are lifted out of the rendered feature.

27. A kit for use in the production of a patterned rendered structural feature according to any one or more of Claims 21 to 26 wherein the kit includes a straight edging strip of similar depth to the strips of the grid-like formers, the thickness of the edging strip being such that it can be held clamped against the extremities along one side of the former by J-shaped elements having their long legs fitted into the holes in the extremities, the short legs then engaging with the outside face of the edging strip.

28. A kit for use in the production of a patterned rendered structural feature according to Claim 27 wherein edging strip is provided which is formed with holes or

grooves similar to those at the extremities of the former, whereby the edging strip can be secured to the former, in similar fashion to the securing of two formers together.

29. A kit for use in the production of a patterned rendered structural feature according to any one or more of Claims 21 to 28 wherein the kit includes a skewer for securing the former and/or an edging strip to a substrate during production of the rendered feature.

30. A method of producing a patterned rendered structural feature comprises the steps of: providing a former which comprises a grid-like structure made up of strips joined together so that the former has radiating branches; laying this former on a substrate; pouring mortar into at least some of the spaces in the grid-like structure of the former and allowing the mortar to set, whereby a rendered feature is provided on the substrate divided into discrete areas by the strips of the former.

31. A method of producing a patterned rendered structural feature according to Claim 30 wherein the former is removed after the mortar has set.

32. A method of producing a patterned rendered structural feature according to Claim 31 wherein, where the rendered feature is longer than the former, it is re-laid in a fresh position on the substrate adjoining the set mortar, and the process repeated to provide an extension of the rendered feature.

33. A method of producing a patterned rendered structural feature according to Claim 32 wherein, at the first position, mortar is placed along at least one side of each branches of the former which projects towards the second position, so that a mortar location strip or strips of mortar is or are formed whereby the former can be brought into abutment with such location strip or strips at the second position.

34. A method of producing a patterned rendered

structural feature comprising the steps of:- assembling two or more grid-like formers edge-to-edge on a substrate, each of which formers comprises a series of strips joined together, so that at least some of the strips radiate from a central feature of the frame, and assembly being such that extremities on the or each abutting pair of assembled frames are in such close juxtaposition that secondary frames are formed, each circumscribed by branch strips on at least two of the assembled formers; pouring mortar into some or all of the secondary frames and allowing the mortar to set, whereby a complete rendered feature is provided on the substrate divided into discrete areas by the strips of the formers.

35. A method of producing a patterned rendered structural feature according to Claim 34 wherein the formers are secured together before the mortar is poured.

36. A method of producing a patterned rendered structural feature according to one or more of claims 30 to 33, or any one or more of Claims 34 to 35, wherein the former is constructed in accordance with any one or more of Claims 1 to 20.

37. A method of producing a patterned rendered structural feature according to Claim 36 wherein the formers are withdrawn from the rendered feature after the mortar has set, leaving divided grooves between the discrete areas of the feature.

38. A method of producing a patterned rendered structural feature according to Claim 37 wherein the grooves are filled or partially filled with cement, mastic, plastics or other pointing material to form outlines in the patterned area.

39. A method of producing a patterned rendered structural feature according to any one or more of Claims 36 to 38 wherein the discrete areas formed within the frames are made of differently coloured materials, so that an overall coloured patterned effect is obtained.

40. A method of producing a patterned rendered structural feature according to Claim 39 wherein the pointing material is of different colour to at least some of the rendering material, whereby distinctively coloured outlines are visible in the finished rendered structural feature.

41. At least one patterned rendered structural feature when made in accordance with any one or more of Claims 30 to 40.

42. At least one patterned rendered structural feature made by a method which involves the use of grid-like formers according to any one or more of Claims 1 to 20.

43. A grid-like former for use in the production of a patterned rendered structural feature substantially as hereinbefore described with reference to the accompanying drawings.

44. A kit for use in the production of a patterned rendered structural feature substantially as hereinbefore described with reference to the accompanying drawings.

45. A method of producing a patterned rendered structural feature substantially as hereinbefore described with reference to the accompanying drawings.